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ABSTRACT

Based on the feeling that the quality of any vocational program is directly and positively related to the quality of equipment used in the program, a study was undertaken of the vocational equipment used in secondary public schools in Ohio. Five questions were addressed by the study: (1) How does the equipment used in vocational education programs compare in technical quality with that used by employers? (2) Is the equipment in the proper state of repair to be useful? (3) At what rate is the equipment wearing out or becoming obsolete? (4) How are boards of education, administrators, and staff dealing with the problems of repair, replacement, and additional needs? and (5) What is the magnitude of resources needed to replace, acquire, and maintain equipment? Ninety-eight schools, representing all types and areas of the state, provided data. Besides survey questionnaires sent to each program, equipment lists were compiled for each, covering items by name, quantity, cost, estimated year of replacement, estimated cost of replacement, estimated maintenance, and estimated cost for miscellaneous equipment. While not a great deal of obsolete equipment was found in use, a considerable percent was classified as only adequate. It was concluded that more realistic attention should be given to equipment used in vocational programs, and a considerable financial effort is needed to correct deficiencies. (ELG)

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A STUDY OF THE VOCATIONAL EQUIPMENT USED IN THE SECONDARY SCHOOLS OF OHIO

FINAL REPORT

Presented to the

OHIO ADVISORY COUNCIL
FOR VOCATIONAL EDUCATION

By the

OFFICE OF EDUCATIONAL SERVICES
UNIVERSITY OF DAYTON
DAYTON, OHIO 45469

MARCH 1, 1979

CE 020 189

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SCHOOL OF EDUCATION

OFFICE OF
EDUCATIONAL SERVICES

March 1, 1979

Ohio Advisory Council for
Vocational Education
5900 Sharon Woods Boulevard
Columbus, Ohio 43229

Ladies and Gentlemen:

The Office of Educational Services is pleased to present this report of the study of vocational equipment used in the secondary schools of Ohio. We sincerely hope that the findings, conclusions and recommendations included in this report will be of assistance to the Council as it continues in its advisory capacity to the various bodies governing vocational education in the state of Ohio.

If it can be of further assistance to the Council, the Office of Educational Services would be pleased to help, especially concerning the interpretation of the data contained in this report.

Sincerely,

John Geiger
Director

JG:jb

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Dr. Martin W. Essex, Executive Director of OACVE

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Dr. Byrl Shoemaker, Executive Director for Vocational Education, State of Ohio

Mr. Robert Balthaser, Assistant Director Vocational Education, Research, Survey and Evaluation

Members of the Project Advisory Committee (page v)

In addition, special thanks is given to the teachers, supervisors and directors of vocational education in schools throughout Ohio who donated many hours of their time to provide the data for the study. A complete list of the cooperating schools is to be found in Appendix A.

I. INTRODUCTION

In September 1977 the Ohio Advisory Council for Vocational Education requested the University of Dayton, Office of Educational Services to conduct a study of vocational equipment used in vocational programs in secondary public schools in Ohio. The pursuit of this study was in keeping with the various purposes for which the Council was founded:

-Advising the State Board of Education regarding the State Plan for Vocational Education;

-Evaluating various aspects of vocational programs at all levels;

-Recommending changes to the State Board of Education and other agencies concerned with vocational education.

The need to more closely examine the status of vocational equipment was prompted by the feeling among the members of the Council that the quality of any vocational program is directly and positively related to the quality of the equipment used in that program. Skills acquired in the laboratory environment should reflect as nearly as is reasonably possible the actual skills needed to perform "on the job." Skills developed on obsolete, inadequate or poorly maintained equipment place the student at a disadvantage and simultaneously result in dissatisfaction on the part of employers and school supporters.

Thus, the Council, in its role as advisor and advocate for vocational education, requested data to provide answers to the following questions:

1. How does the equipment in use in vocational education programs compare in technical quality with equipment in use by Ohio employers?

2. Is the equipment now in use in the proper condition (state of repair) to ensure student learning the skills necessary for employment?
3. At what rate is the equipment wearing out or becoming obsolete?
4. How are boards of education, administrators and staff dealing with the problems of repair, replacement and additional needs?
5. What is the magnitude of the resources needed to (1) replace outdated, worn-out equipment, (2) acquire needed additional equipment, and (3) assure continued and adequate programs of maintenance and replacement.

It was felt by the Council that the data generated by the study would provide the basis for making reasonable recommendations for the funding of vocational equipment in secondary schools in Ohio.

Further justification for the study was given through several references to the study in the Staff Research Report No. 126 of the Ohio Legislative Service Commission. This report, A Program Review of Secondary Vocational Education in Ohio: Job Placement and State Funding indicated that the study by the OACVE would "clarify the magnitude of the problem (equipment)."[1]

The report indicated that vocational Education Planning District (VEPD) superintendents felt the most poorly funded component of the distribution formula was that of materials, supplies and equipment (the "override"). A majority of 61% indicated this.[2]

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[1] Ohio Legislative Service Commission, Staff Report No. 126, April 1978, p. 53.

[2] Ibid., P. 52.

Also, 59% said that equipment replacement was their most pressing capital need with another 16% indicating new equipment needs as most pressing.[3] As one superintendent was quoted in the report, "As equipment becomes obsolete, it loses its training value...attention must be given from the state of Ohio to the replacement of equipment, thus maintaining the quality of the state's investment in the vocational education delivery system."[4]

II. DESIGN OF THE STUDY

The original study design consisted of four phases. These were generally followed with only a few changes.

Phase I consisted of the selection of the study Advisory Committee, development of the various survey instruments, sample selection, field testing and the design of the computer program to handle the data.

Phase II had several components. Through verbal and written communications, attempts were made to acquaint superintendents, supervisors and vocational teachers with the project. Survey forms were sent to selected programs in schools throughout Ohio. As returns were received the data were checked, corrected and stored into the computer.

Phase III consisted of an initial run of the program to produce sample print-outs for review. Data were verified, the format checked and several sample schools were requested to compare the data with their programs. Additional program changes were made and the final print-out generated.

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[3] Ibid., p. 52.

[4] Ibid., p. 53.

Phase IV included the preparation of the final report and its presentation to the Council. A more detailed review of the activities of each phase follows:

Phase I

One of the first activities of the study was to determine the availability of equipment lists for the vocational programs in use. It was planned to use these "typical", or "suggested" equipment lists as a beginning point for the survey. Contacts with various vocational areas revealed that, while there were lists for some programs, most did not have such lists. Discussions with state vocational personnel revealed that there was a reluctance to dictate equipment needs to local schools. It was preferred that these be developed by local staff, supervisors and craft committees, with state department assistance.

Publications which were available included:

Ohio Department of Education. Facilities and Equipment. Division of Vocational Education: Business and Office Education. (Mimeographed Report). (Contains planning information, program description, and equipment lists for the 12 more common programs. For 1977-78 there were 17 programs in operation while the Reporting Manual lists 26 programs.)

_____. Initiation and Maintenance Costs. Division of Vocational Education: Distributive Education. (Mimeographed Report). (Contains start-up costs and an equipment list for Distributive Education. Also has estimated equipment costs for the 9 most common D.E. programs. There were 24 programs in operation in 1977-78 and 31 listed in the Reporting Manual.)

_____. Suggested Guidelines: Trade, Industrial and Health Occupation Programs. Division of Vocational Education: Trade and Industrial Education. (Contains program descriptions, course objectives, suggested equipment and course content for 21 Trades and Industry programs and 5 Health Occupations programs. There were 55 T & I programs and 13 Health Occupations programs in operation in 1977-78. The Reporting Manual lists 82 T & I and 42 Health programs.)

_____. Space and Equipment Planning Resource Guide. Division of Vocational Education: Home Economics. (This is a space and resource equipment planning guide for dual role consumer and homemaking education. It does not contain assistance for the job training programs.)

Thus, for the over 135 programs which were operational in 1977-78 there were available equipment lists for only 49. Most of these did not indicate itemized costs. The Division of Vocational Education had available an Equipment Depreciation Table 1976-77 on which were listed estimated equipment costs to start-up programs along with their depreciation rates. This table did not specify the equipment used in the programs, only total cost estimates.

Inquiries to the states of Indiana, Pennsylvania and Kentucky produced similar results. Indiana has equipment lists available for some programs, primarily Trade and Industrial.

Since so few equipment lists were available and those that were available were too sketchy, the decision was made to proceed as though no such lists existed. The development of equipment lists thus became a priority item.

This decision, to first generate an equipment list for each program (in so far as possible), led to another more crucial decision. The only method for determining with near 100% certainty the amount, scope and status of each piece of vocational equipment would be through a state wide inventory. Such a procedure would have been too costly, time consuming, and beyond the intended scope of the project.

Discussions with vocational school personnel, the study Advisory Committee and State Department officials indicated that, except for minor differences, vocational programs throughout the state varied little in terms of equipment used. Furthermore, over a period of years, maintenance, replacement and additional needs would be similar

for programs having the same taxonomy. Given these similarities, it was decided to sample programs, generate equipment lists, costs and needs from these samples, and project for the state on the basis of these data.

Where a great number of similar programs existed, multiple samples were drawn. A comparison of these showed the assumption of similarity to be true.

The sample of school programs for the study was drawn from a list of in-school Vocational Education Programs provided by the Division of Vocational Education, State Department of Education. Though program sites were randomly selected some were discarded and others drawn to assure that all areas of the state were covered and that all types of schools were used. The list of cooperating schools may be found in Appendix A. This list shows that 98 schools provided data. They come from 56 of the 103 VEPD's and represent all types of schools.

The survey forms found in Appendix B were developed by the study team with the assistance of the Advisory Committee. The instrument was field tested at four sites and with various programs. As the field testing data were received and the forms revised, the programs for computing and storing the data were also developed. Phase I of the project was completed in early May 1978.

Phase II

Survey forms were sent out in early May 1977. This mailing included:

1. A cover letter explaining the project
2. A set of directions
3. An equipment inventory form (Appendix B)

4. A form to list additional needs (Appendix B)

5. A questionnaire (Appendix B)

The initial return rate was extremely low even though the study team had made presentations to various state groups prior to the survey and news of the study had appeared in several publications. Follow-up letters were sent to the schools and to supervisors. Table I shows the initial response rate.

TABLE I

INITIAL RESPONSES TO SURVEY

Program Area	Total Sent	Returns (%)	Programs	Program Inventories (%)
01.	20	10 (50%)	11	7 (64%)
04.	28	8 (29%)	24	5 (21%)
07.	17	9 (53%)	13	5 (38%)
09.	36	20 (56%)	19	11 (58%)
14.	28	15 (54%)	17	11 (65%)
17.	73	34 (47%)	55	30 (55%)
Total	202	96 (48%)	139	69 (60%)

Source: Office of Educational Services

The low rate of return and corresponding lack of equipment data made it necessary to move the project completion date back. Additional appeals for assistance were made through supervisors, directors and superintendents. The response was most helpful. Table II shows the final results. Of the total of 139 programs requested only 19 are still outstanding. These are programs which are relatively small in number, have small amounts of equipment or are non-job training.

TABLE II

FINAL SURVEY RESPONSE RATE

Program Area	Total Sent	Returns (%)	Programs	Program Inventories (%)
01.	27	13 (48%)	11	11 (100%)
04.	47	20 (43%)	24	16 (67%)
07.	26	15 (58%)	13	12 (92%)
09.	48	30 (62%)	19	17 (89%)
14.	34	22 (65%)	17	14 (82%)
17.	100	61 (61%)	55	50 (91%)
Total	282	161 (58%)	139	120 (86%)

Source: Office of Educational Services

Phase II of the project was completed by mid-January of 1979.

Phase III began shortly after Phase II began and ran concurrently with it. It was completed by February 1 of 1979.

III. FINDINGS AND CONCLUSIONS

Equipment Survey Findings

The programs for which equipment lists were generated may be found in Appendix C. Listed also are those programs for which lists are not yet available. The developed equipment lists are not included in this report. They are available from the Ohio Advisory Council for Vocational Education.

These equipment lists provided the following information.

1. The item by name and quantity
2. Cost when purchased, present value and estimated present replacement cost
3. Year when the item should be replaced, if before 1990.
4. Cost at the time of replacement including a 7% inflationary factor.

5. Estimated maintenance cost per unit, per year

6. Estimated similar costs for miscellaneous equipment

For the purpose of this survey, equipment was defined as "All items of vocational equipment, the purchase price of which (or value if purchased used or donated) was $100 or higher in the laboratory setting (not in the related classroom) purchased through (a) accounts D_4, D_7, H_5 or H_{5a} or their equivalents, of the general fund; (b) building funds (BF); or (c) through state or federal funds not covered in (a) or (b)."

The above information was generated for basic equipment and for supplemental equipment. Basic equipment was defined as "equipment necessary for establishing the program." Supplemental was that equipment for which "purchase could be delayed and the program still meet minimum standards."

Another list generated was that called "additional" equipment needs. Here were itemized those pieces of additional equipment needed to complete the program needs.

The data on the equipment lists were summarized in several ways:

1. For each program (e.g. dental assistant 07.0101) a schedule for maintenance, replacement, additional and total cost per year through 1989
2. A similar composite schedule for all dental assistant locations
3. A similar schedule for individual program areas (Tables IV - IX)
4. A similar schedule for all vocational programs for the state. (Table III)

A brief summary of the costs detailed in Table III through XI shows the following for maintenance, replacement and for purchasing needed additional equipment. This is based on an average yearly cost from 1978 through 1989.

Average yearly cost:	01. Vo-Ag.	$ 1,185,150	
:	04. D.E.	3,369,140	
:	07. Health	1,144,229	
:	09. Home Ec.	6,564,364	
:	14. BOE	10,808,455	
:	17. T & I	11,380,854	
:	Total for State		$34,452,164

On Table X is listed the yearly costs for JOB TRAINING only. NON-JOB TRAINING costs are listed on Table XI.

Average yearly cost:	JOB TRAINING	$27,684,048
:	NON-JOB TRAINING	6,768,116
:	Total for State	$34,452,164

For comparison purposes figures supplied by the State of Ohio: Division of Vocational Education were used. VEPD superintendents estimated their supplemental and replacement equipment needs 1978 through 1982 (SUPPLEMENTAL RESOURCE REPORT: Attachment D. Division of Vocational Education)

In order to make legitimate comparisons the data in Table XII include the following changes. Maintenance costs in the figures generated by the present study have been subtracted. A column has been added showing the effects of a 7% inflation rate on the Vocational Division figures.

TABLE III

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

TOTAL FOR STATE: ALL PROGRAMS

Year	Maintenance	Replacement	Additional	Total
1978	$ 5,680,031	$22,702,113	$ 3,065,339	$31,447,483
1979	6,077,632	8,189,694	28,755,842	43,023,169
1980	6,503,074	13,566,011	1,788,264	21,857,341
1981	6,958,283	27,015,288	--	33,973,568
1982	7,445,365	12,822,906	70,914	20,339,181
1983	7,966,536	18,080,914	--	26,047,450
1984	8,524,191	34,802,035	--	43,326,221
1985	9,120,888	30,184,980	--	39,305,864
1986	9,759,347	46,774,787	--	56,534,135
1987	10,442,725	19,325,931	--	29,768,655
1988	11,173,476	18,132,866	--	29,306,347
1989	11,955,625	26,540,929	--	38,496,555
Average	$ 8,468,764	$23,176,703	$ 2,806,697	$34,452,164

Source: Office of Educational Services

TABLE IV

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

01. VOCATIONAL AGRICULTURE: TOTAL

Year	Maintenance	Replacement	Additional	Total
1978	$325,992	$420,737	$230,983	$977,712
1979	348,811	259,716	--	608,527
1980	373,227	119,727	327,957	820,908
1981	399,354	341,431	--	740,785
1982	427,309	275,671	--	702,981
1983	457,221	897,449	--	1,354,670
1984	489,225	365,623	--	854,848
1985	523,472	1,264,046	--	1,787,515
1986	560,115	626,871	--	1,186,985
1987	599,336	734,118	--	1,333,454
1988	641,274	1,653,876	--	2,295,150
1989	686,164	872,103	--	1,558,268
Average	$485,958	$ 652,614	$ 46,578	$1,185,150

Source: Office of Educational Services

TABLE V

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

04. DISTRIBUTIVE EDUCATION: TOTAL

Year	Maintenance	Replacement	Additional	Total
1978	$278,900	$1,199,882	$1,326,244	$2,805,02
1979	298,423	18,800	22,630,206	22,947,42
1980	319,313	377,131	2,225	698,66
1981	341,665	571,965	--	913,63
1982	365,581	768,600	131	1,134,31
1983	391,172	1,824,565	--	2,215,73
1984	418,554	1,076,154	--	1,494,70
1985	447,852	1,254,554	--	1,702,40
1986	479,202	1,137,640	--	1,616,84
1987	512,757	710,415	--	1,223,17
1988	548,639	2,391,735	--	2,940,37
1989	587,043	150,337	--	737,38
Average	$415,758	$ 956,815	$1,996,567	$3,369,14

Source: Office of Educational Services

TABLE VI

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

07. HEALTH OCCUPATIONS: TOTAL

Year	Maintenance	Replacement	Additional	Total
1978	$159,583	$ 697,120	$ 66,690	$ 923,39
1979	170,754	232,939	165,336	569,02
1980	182,707	120,369	711,349	1,014,42
1981	195,496	331,325	--	526,82
1982	209,181	2,056,842	--	2,266,02
1983	223,823	885,592	--	1,109,41
1984	239,491	1,408,555	--	1,648,04
1985	256,255	179,366	--	435,62
1986	274,193	1,821,566	--	2,095,75
1987	293,393	421,706	--	706,09
1988	313,923	1,176,110	--	1,490,03
1989	335,899	610,182	--	946,08
Average	$237,892	$ 827,723	$ 78,615	$1,144,22

Source: Office of Educational Services

TABLE VII

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

09. VOCATIONAL HOME ECONOMICS: TOTAL

Year	Maintenance	Replacement	Additional	Total
1978	$ 815,209	$ 642,197	$265,270	$1,722,67
1979	872,274	2,879,554	113,663	3,865,49
1980	933,338	5,932,741	3,091	6,869,17
1981	998,665	3,435,388	--	4,434,05
1982	1,068,576	4,085,925	--	5,154,50
1983	1,143,372	6,422,905	--	7,566,27
1984	1,223,408	5,447,101	--	6,670,50
1985	1,309,049	7,328,036	--	8,637,08
1986	1,400,678	5,576,276	--	6,976,95
1987	1,498,755	8,545,648	--	10,044,40
1988	1,603,638	7,334,218	--	8,937,86
1989	1,715,896	6,177,159	--	7,893,05
Average	$1,215,238	$5,317,262	$ 31,835	$6,564,33

Source: Office of Educational Services

TABLE VIII

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

14. BUSINESS AND OFFICE EDUCATION: TOTAL

Year	Maintenance	Replacement	Additional	Total
1978	$1,956,483	$ 6,764,219	$ 190,000	$ 8,910,702
1979	2,093,437	247,004	4,845,495	7,185,936
1980	2,239,979	5,717,936	414,512	8,372,425
1981	2,396,777	18,111,781	--	20,508,555
1982	2,564,549	2,036,910	--	4,601,459
1983	2,744,068	2,836,556	--	5,580,624
1984	2,936,154	8,230,192	--	11,166,346
1985	3,141,683	7,525,183	--	10,666,867
1986	3,361,602	24,885,148	--	28,246,750
1987	3,596,992	4,565,487	--	8,162,479
1988	3,848,698	2,165,228	--	6,013,929
1989	4,118,109	6,167,284	--	10,285,392
Average	$2,916,544	$7,437,744	$454,167	$10,808,455

Source: Office of Educational Services

TABLE IX

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

17. TRADE AND INDUSTRIAL EDUCATION: TOTAL

Year	Maintenance	Replacement	Additional	Total
1978	$2,143,863	$12,977,959	$ 986,152	$16,107,974
1979	2,293,934	4,551,682	1,001,142	7,846,758
1980	2,454,510	1,298,107	329,129	4,081,745
1981	2,626,326	4,223,399	--	6,849,725
1982	2,810,168	3,598,957	70,783	6,479,907
1983	3,006,880	5,213,846	--	8,220,725
1984	3,217,360	18,274,410	--	21,491,769
1985	3,442,576	12,633,795	--	16,076,369
1986	3,683,557	12,727,287	--	16,410,844
1987	3,941,491	4,357,558	--	8,299,049
1988	4,217,303	3,411,698	--	7,628,998
1989	4,512,514	12,563,863	--	17,076,379
Average	$3,195,874	$7,986,047	$198,934	$11,380,652

Source: Office of Educational Services

TABLE X

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

TOTAL FOR STATE: JOB TRAINING

Year	Maintenance	Replacement	Additional	Total
1978	$4,775,309	$21,6[illegible]5,291	$ 2,780,602	$29,231,2
1979	5,109,581	5,237,[illegible]85	28,752,488	39,099,8
1980	5,467,255	7,561,85[illegible]	1,785,173	14,814,2
1981	5,849,963	23,599,821	--	29,449,7
1982	6,259,456	8,815,882	70,914	14,426,2
1983	6,697,619	11,081,290	--	17,778,9
1984	7,166,451	29,414,586	--	36,581,0
1985	7,668,103	22,313,197	--	29,981,2
1986	8,204,872	41,555,641	--	49,760,5
1987	8,779,401	10,926,317	--	19,705,7
1988	9,393,755	10,984,601	--	20,378,3
1989	10,051,321	20,230,078	--	30,281,4
Average	$7,120,090	$17,781,526	$2,782,432	$27,684,0

Source: Office of Educational Services

TABLE XI

EQUIPMENT MAINTENANCE/REPLACEMENT SCHEDULE

TOTAL FOR STATE: NON-JOB TRAINING

Year	Maintenance	Replacement	Additional	Total
1978	$ 904,721	$1,026,822	$284,737	$2,216,280
1979	968,051	2,951,911	3,354	3,923,316
1980	1,035,819	6,004,160	3,091	7,043,068
1981	1,108,320	3,415,467	--	4,523,807
1982	1,185,908	4,007,024	--	5,192,931
1983	1,268,917	6,999,624	--	8,268,541
1984	1,357,740	5,387,449	--	6,745,185
1985	1,452,785	7,871,783	--	9,324,571
1986	1,554,475	5,219,146	--	6,773,622
1987	1,663,323	8,399,614	--	10,062,937
1988	1,779,721	7,148,265	--	8,927,992
1989	1,904,304	6,310,851	--	8,215,154
Average	$1,348,674	$5,395,177	$24,265	$6,768,116

Source: Office of Educational Services

TABLE XII

A COMPARISON OF VEPD ESTIMATES

AND OACVE ESTIMATES FOR SUPPLEMENTAL

AND REPLACEMENT 1978-1982: ALL PROGRAMS

Year	VEPD Estimates[1]	VEPD Estimates (corrected for inflation)[2]	OACVE Estimates less maintenance
1978	$12,273,912	$12,273,912	$25,767,453
1979	11,818,758	12,646,071	36,945,537
1980	12,699,449	15,486,789	15,354,267
1981	13,547,169	16,595,862	27,015,285
1982	13,714,105	17,976,392	12,893,816
Average	$12,810,678	$14,995,805	$23,595,271

[1] Source: State Department of Education: Division of Vocational Education

[2] .07 inflation rate per year

Briefly summarized:

Average yearly costs:	VEPD Estimates	$12,810,678
(1978-1982) :	VEPD X 7%	14,995,805
:	OACVE Study	23,595,271

Respondents to the equipment survey were asked to indicate, for each piece of equipment, its condition:

1. Up-to-date
2. Adequate: adequate for teaching but not up-to-date
3. Obsolete

A summary of the information provided shows the following:

TABLE XIII

CONDITION OF EQUIPMENT

Area	Up to date	Adequate	Obsolete
01.	81%	18%	1%
04.	72%	23%	5%
07.	55%	43%	2%
09.	87%	13%	-
14.	80%	17%	3%
17.	52%	43%	5%

Source: Office of Educational Services

Not a great deal of obsolete equipment is being used, but a considerable percent is listed as adequate, the highest being in the areas of Health Occupations (07.) and Trades and Industry (17.)

An often quoted phrase is that "vocational equipment is heavily used." In a vocational school it would be available for use all day in any program having two units (two labs). In addition some schools offer an additional unit later in the day. At the comprehensive high school some equipment might also be used in other programs (e.g. typewriters in typing class and also in a vocational class). In addition, many schools have large attendance in adult evening programs.

TABLE XIV

USE OF EQUIPMENT IN OTHER SCHOOL PROGRAMS

Area	Not Used	Used 25% or more
01.	93%	7%
04.	82	18
07.	95	5
09.	70	30
14.	59	41
17.	82	18

Source: Office of Educational Services

TABLE XV

USE OF EQUIPMENT IN ADULT PROGRAMS

Area	Not Used	Used 10-20%	Used 30% or more
01.	88%	12%	-
04.	96	4	-
07.	81	15	4%
09.	91	9	-
14.	50	35	14
17.	49	39	12

The data above show that equipment does not stand idle. It receives considerable use. Especially heavy use is made in adult programs in BOE (14.) and T & I (17.)

Questionnaire Findings

The questionnaire accompanying the inventory of equipment posed several questions concerning maintenance/replacement schedules and budgets. The responses (124) listed are only those who answered the form for questions. This rate was 51%, but all were returned because the questionnaire also requested an estimation of miscellaneous equipment values.

1. Do you have a planned program of equipment replacement?

   Yes: 58 (48%) No: 63 (52%)

   Those responding "No" generally gave one of the three following reasons

   a. We replace when money is available
   b. We ask when something is needed
   c. District priorities are established when and if money is available

2. Do you have an equipment replacement budget for your program?

   Yes: 72 (58%) No: 52 (42%)

   Those responding "No" to this question indicated that equipment was replaced when

   a. money was available,
   b. when the equipment was no longer useable, or
   c. matching state funds were available.

   Another comment indicated "nobody knows what the budget is."

3. Does the district have a maintenance schedule and budget for the equipment in your program?

   Yes: 82 (68%) No: 38 (32%)

   The answering "No" indicated the following types of responses to how maintenance was carried out.

   a. Teacher does it.

   b. Have budget but no schedule

   c. When equipment breaks, it is repaired as needed.

4. If your program is used for adult training programs...

   a. do any of the fees come directly to your budget?

      Yes: 19 (23%) No: 65 (77%)

   b. does this use have any significant effect on the life of the equipment?

      Yes: 46 (49%) No: 48 (51%)

Conclusions

1. There is a need to give more realistic attention to the equipment being used in vocational programs. The yearly dollar estimates given in Table III tend to be conservative figures. They do not include some programs for which information was not available. In addition, since the major thrust for vocational education has been taking place during the past decade, equipment acquired during that period (and before) now needs to be upgraded and/or replaced. The continual factor of inflation only adds to the problem.

2. The estimates given by the VEPD superintendents as shown in Table XII are conservative even when applying a percent for inflation.

3. While not much equipment currently in use is classified as "obsolete", there is much that is classified as "adequate", meaning that it can be used for instruction but is not equal to its counterpart "on-the-job."

4. A considerable financial effort is needed within the next several years to correct the deficiencies now existing. The 1978 data and requested needs are already past thus adding to the severity of the problem.

5. About one-half of those surveyed have planned programs and budgets for equipment replacement.

6. About one-third of those surveyed do not have schedules and budgets for equipment maintenance.

7. Vocational equipment in the secondary schools receives constant use during the regular school day with much receiving additional use through extended school days and adult programs.

8. Respondents were about equally divided on whether use in adult programs cause appreciable shortening of the life span of the equipment. Most noticeable was in the area of Business and Office Education where respondents indicated that use in adult programs did shorten equipment life.

9. Levels of funding (both past and those recommended in the Executive Budget 1980-81) have not been and will not be sufficient to support the maintenance, replacement and additional equipment needs of vocational education.

IV. RECOMMENDATIONS

The proposal for the study agreed upon by the Advisory Council and the Office of Educational Services did not include recommendations to be given. Nevertheless the Office offers these recommendations to the Council as they deliberate the contents and findings of this report.

1. It is recommended that the Council pursue the increase in the level of funding for vocational education, and that special emphasis be given to funding for maintenance, replacing and adding needed equipment.

2. It is recommended that schools be encouraged (if not required) to have planned schedules and budgets for maintaining equipment. Those programs having extended day or adult programs should have an increased usage factor built-in.

3. It is recommended that schools be encouraged (if not required) to have planned schedules and budgets for the replacement for their vocational equipment. A program such as the one developed for this study can easily be calculated by hand for individual programs.

4. If increased funds for equipment are made available then recommendations #2 and #3 should be mandatory so that it will be certain that allocated funds are properly channeled.

5. It is recommended that all schools having vocational programs have written inventories of their vocational equipment separated by individual programs and location.

6. It is recommended that the Division of Vocational Education, Department of Education, work toward the development of an inventory system which would assist local districts in maintaining an up-to-date

record of vocational equipment on hand. Such inventories are now the option of the local district and range from the very complete to the almost nonexistent. Such an inventory format might be developed to include Recommendation #3.

7. It is recommended that equipment lists be developed for those programs not included in this study and for those new programs that might have been initiated since the study began.

8. It is recommended that (if not now available) the Council initiate a cost-effective study of individual programs. When one reviews the print-out it becomes obvious that some programs cost more to initiate than others. On the other hand, other programs are much more costly to maintain. A study of cost-per-pupil graduated over a period of time might be helpful, especially, if decisions need to be made in light of funding limitations.

APPENDIX A

COOPERATING SCHOOLS

School Name	City
Ansonia High School	Ansonia
Ashland County-West Holmes J.V.S.	Ashland
Auburn Career Ctr. J.V.S.	Painesville
Aviation High School	Cleveland
Beaver Local High School	Lisbon
Belmont County J.V.S.	St. Clairsville
Brooklyn High School	Brooklyn
Buchtel High School	Akron
Buckeye Hills Career Ctr.	Rio Grande
Canton McKinley High School	Canton
Carrollton High School	Carrollton
Central Hower High School	Akron
Central Ohio J.V.S.	Plain City
Clay High School	Oregon
Colerain High School	Cincinnati
Coshocton High School	Coshocton
Cuyahoga Valley J.V.S.	Brecksville
Devilbiss High School	Toledo
Diamond Oaks J.V.S.	Cincinnati
D. Russel Lee J.V.S.	Hamilton
East High School	Akron
Eastland J.V.S.	Groveport
EHOVE J.V.S.	Milan
Ellet High School	Akron
Euclid High School	Euclid

School Name	City
Findlay High School	Findlay
Fort Hayes Career Ctr.	Columbus
Four County J.V.S.	Archbold
Garfield High School	Akron
Genoa Area Local High School	Genoa
Graham High School	St. Paris
Great Oaks J.V.S.	Cincinnati
Greene County J.V.S.	Xenia
Guernsey-Noble J.V.S.	Georgetown
Hiland High School	Berlin
Hilltop High School	West Unity
Hoover High School	North Canton
Hughes High School	Cincinnati
Jefferson County J.V.S.	Bloomingdale
Job Training Center	Dayton
John Hay High School	Cleveland
Kiser High School	Dayton
Knox County J.V.S.	Mt. Vernon
Laurel Oaks J.V.S.	Wilmington
Libbey High School	Toledo
Licking County J.V.S.	Newark
Live Oaks J.V.S.	Milford
Logan High School	Logan
Macomber-Whitney High School	Toledo
Mansfield High School	Mansfield

School Name	City
Manpower Training Center	Cleveland
Maplewood J.V.S.	Ravenna
Max Hayes High School	Cleveland
Medina County J.V.S.	Medina
Middlebranch Jr. High School	North Canton
Middletown High School	Middletown
Milford High School	Milford
Montgomery County J.V.S.	Clayton
Muskingum Area J.V.S.	Zanesville
National Trail High School	New Paris
North High School	Akron
North Central High School	Pioneer
Northview High School	Sylvania
Ohio Hi-Point J.V.S.	Bellefontaine
Olmstead Falls High School	Olmstead Falls
Parma High School	Parma
Penta County J.V.S.	Perrysburg
Pickaway-Ross County J.V.S.	Chillicothe
Piketon High School	Piketon
Pioneer J.V.S.	Shelby
Polaris J.V.S.	Middleburg Hts.
Scarlet Oaks J.V.S.	Cincinnati
Seneca East High School	Attica
South High School	Cleveland
Southeast Career Ctr.	Columbus
Southern Hills J.V.S.	Georgetown
Start High School	Toledo

School Name	City
Stivers-Patterson High School	Dayton
Streetsboro High School	Streetsboro
Sylvania Northview Nigh School	Sylvania
Taft High School	Cincinnati
Timken High School	Canton
Tri-Rivers J.V.S.	Marion
Triway Local High School	Wooster
Troy High School	Troy
Upper Sandusky High School	Upper Sandusky
Upper Valley J.V.S.	Piqua
Vanguard J.V.S.	Fremont
Vantage J.V.S.	Van Wert
Wadsworth High School	Wadsworth
Wapakoneta High School	Wapakoneta
Warren County J.V.S.	Lebanon
Washington County J.V.S.	Marietta
Wayne County J.V.S.	Smithville
Waynedale High School	Applecreek
W.C. Smith J.V.S.	Canfield
W.G. Harding High School	Warren
Western Hills High School	Cincinnati
Whetstone High School	Columbus
Whitmer High School	Toledo

APPENDIX B

OACVE **Additional** Vocational Equipment Needs Survey

VEPD # _____ NAME _____ Page _____ of _____

Service area _____ School district _____ I.D. _____ Program type _____

School _____ I.D. _____ Instructional Code _____ Name _____

(4) Item	(5) Quantity needed	(6) Model (descriptors) Manufactr. Size	(8) Date (year) needed	(12) Estimated present cost	(15) Is item (✓) B	S	

OACVE Vocational Equipment Survey

VEPD # ____ Name _____

Service Area _____

School District _____ I.D. _____ Instructional Code # _____ Name _____

(1) Year program was established _____ (2) # Units (1977-78) _____ (3) Program Type _____

(4) Item	(5) Quantity on hand	(6) Model # Description, size or Manufacturer	(7) Was item (✓)		(8) Date of purchase (year)	(9) Condition when acquired (✓)		(10) Purchase price per unit	(11) Present estimated value per unit	(12) Present estimated replacement cost per unit	(13) Estimated Life of item from date of purchase (years)	(14) Estimated yearly maintenance cost per unit	(15) Basic or supplemental item? (✓)		(16) Technical Quality (✓)			(17) Upon wear out will item be replaced (✓)		(18) % Use in other program (✓)				(19) % Use in adult education (✓)				
			purchased	loan or gift		New	Used						B	S	up to date	adequate	obsolete	Yes	No	0	25	50	75	0	10	20	30	40

O.A.C.V.E.
QUESTIONNAIRE

1. If your equipment is used in adult education - - -

   A. Do any of the fees from the adult program come back directly to your program budget?

      _____Yes _____No

   B. Do you feel that the use of the equipment in adult classes has any significant effect on the life of the equipment?

      _____Yes _____No

2. Do you have a planned program of equipment replacement?

   _____Yes _____No...If "No", how is worn out, obsolete equipment replaced?

3. Do you have an equipment replacement budget for your program?

   _____Yes _____No...If "No", how is money allocated when equipment must be replaced?

4. Does the district have maintenance schedule and budget for the equipment in your program?

   _____Yes _____No...If "No", how is maintenance scheduled and budgeted?

APPENDIX C

AVAILABLE EQUIPMENT LISTS

01.0100	Agricultural Production
.0101	Animal Protection & Care
.0104	Farm Business Mgmt.
.0200	Agricultural Supl/Serv.
.0300	Agricultural Ind. Equip./ Serv.
.0400	Ag. Products Processing
.0500	Horticulture
.0600	Ag. Resources
.0699	Environmental Mgmt.
.0700	Forestry
.9900	Other Agriculture
04.0100	Advertising Services
.0101	Radio Broadcasting
.0102	Television
.0200	Apparel & Accessories
.0301	Auto. Parts Mgmt.
.0400	Finance & Credit
.0600	Food Distribution
.0702	Food Service Personnel
.0800	General Merchandise
.0801	Marketing Mgmt.
.1501	Vocational Music
.1502	Performing Arts
.1600	Petroleum
.1800	Recreation & Tourism
.1900	Transportation
.3100	Other Wholesale Trade
07.0101	Dental Assistant
.0103	Dental Lab. Tech.
.0203	Medical Lab. Assisting
.0302	Practical (Voc.) Nurse
.0303	Nurses' Assistant
.0305	Surgical Technician
.0401	Occ. Therapy
.0603	Optometrist Assistant
.0904	Medical Assistant
.0912	Pharmacy Assistant
.9960	Diversified Co-op Health Occ.
09.0101	Comp. Homemaking
.0102	Child Development
.0103	Clothing & Textiles
.0105	Family Health
.0106	Family Relations
.0107	Foods & Nutrition
.0108	Home Mgmt.
.0109	Housing & Home Furnishings
.0195	Consumer & Hmmkg. Impact Prog.
.0199	Family Life Education
.0201	Child Care
.0202	Fabric Service
.0203	Food Service
.0204	Home Furn., Equip. & Serv.
.0206	Therapeutic Recreation
.0213	Catering Service

Available Equipment Lists (Cont.)

07.0223 Baker

14.0100 Acct. & Comp. Occ.
.0200 Bus. Data Proc. Sys.
.0301 Duplicating Operator
.0302 Clerical Serv. Clerk
.0303 General Office Clerk
.0304 Agency Clerk
.0399 Office Machines Operator
.0402 Correspondence Clerk
.0406 Medical Records Clerk
.0500 Mat. Support, Transporting, Storing & Recording
.0600 Personnel Trn. & Related Occ.
.0700 Steno, Sec. & Related Occ.
.0702 Sec, Clerk Stenographer
.0900 Typing & Related Occ.

17.0100 Air Cond. & Heating
.0101 Cooling
.0102 Heating
.0200 Appliance Repair
.0301 Body & Fender
.0302 Mechanics
.0303 Specialization
.0400 Aviation Occ.
.0401 Aircraft Maintenance
.0403 Ground Operations
17.0600 Business Machines Maint.
.0700 Commercial Art Occ.
.0801 Seamanship
.0802 Marine Maint.
.0900 Commercial Photo. Occ.
.1001 Carpentry
.1002 Electrician
.1004 Masonry
.1005 Painting & Decorating
.1007 Plumbing & Pipefitting
.1011 Building Maintenance
.1012 Industrial Maintenance
.1013 Resilent Floor Layer
.1016 Mobile Home Serv. Mgmt.
.1200 Diesel Mechanic
.1201 Mine Maint. Mechanic
.1300 Drafting Occ.
.1402 Power Transmission
.1501 Communication Electronics
.1502 Industrial Electronics
.1504 Tele-communication
.1900 Graphic Occ.
.2000 Chemical Lab
.2004 Industrial Lab. Assistant
.2302 Machine Shop
.2304 Metal Fabrication (Heavy)

Available Equipment Lists (Cont.)

17.2305	Sheet Metal
.2306	Welding & Cutting
.2602	Cosmetology
.2700	Plastics Occ.
.2801	Firefighter Training
.2802	Law Enforcement Training
.3000	Refrigeration
.3100	Small Engine Repair (Internal Combustion)
.3203	Hydraulic/Pneumatic Occ.
.3400	Leatherworking
.3500	Upholstering
.3601	Millwork & Cabinet Making
.3602	Wood Patternmaking
.9999	Occ. Work Experience

THOSE NOT AVAILABLE

04.0601	Food Dist. Personnel
.0700	Food Services
.0900	Hdwe, Bldg. Mat., Farm & Garden Supl. & Equip.
.1100	Hotel & Lodging
.1200	Industrial Marketing
.1300	Insurance
.1500	Personal Services
.9998	Occ. Work Adjustment
07.0906	Community Health Aide
09.0104	Consumer Education
.0205	Community & Home Service
14.0499	Adm. Secy.
.0703	Steno, Conf/Court Reporter
.0800	Supervisory & Adm. Mgmt. Occ.
17.1100	Custodial Services
.1403	Motor Repair
.2303	Machine Tool Operation
.2307	Tool & Die Making
.9903	Other T & I Occ.
.9905	Other T & I Occ.